

## NEW DWARF CRAYFISHES (DECAPODA: CAMBARIDAE) FROM MEXICO AND FLORIDA

Horton H. Hobbs, Jr.

*Abstract.*—*Cambarellus chihuahuae*, described from northern Chihuahua, Mexico, has its closest affinities with *C. areolatus* (Faxon, 1885) and *C. alvarezi* Villalobos (1952). *Cambarellus blacki*, known from a small cypress pond in Escambia County, Florida, is closely related to *C. schmitti* Hobbs (1942) and *C. lesliei* Fitzpatrick and Laning (1976).

---

The two crayfishes described here are the third and fourth members of the genus *Cambarellus* named since Hobbs (1974) listed 12 members of the genus in his checklist of North and Middle American crayfishes. The description of *Cambarellus texanus* Albaugh and Black (1973:177) from southern Texas appeared before the publication of the checklist but too late to be listed. *Cambarellus lesliei* Fitzpatrick and Laning (1976:138), ranging in southern Alabama and southeastern Mississippi, is the most recently described. The crayfishes reported here are distantly related species, one occurring in the northern part of Chihuahua, Mexico, and the other in the western part of the panhandle of Florida.

*Cambarellus chihuahuae*, new species

Fig. 1

*Diagnosis.*—Pigmented, eyes well developed. Rostrum with marginal spines or tubercles, median carina absent. Carapace without cervical spine. Areola 1.4 to 2.5 (average 1.9) times as long as broad and constituting 26.0 to 30.8 (average 28.4) percent of total length of carapace (34.7 to 40.4, average 37.3, percent of postorbital carapace length). Suborbital angle acute to slightly obtuse. Branchiostegal spine small or rudimentary. Postorbital ridge with acute cephalic extremity. Antennal scale approximately 2.4 times as long as broad, widest at midlength. Merus of cheliped with dorsal, ventral, and distolateral spines; carpus with distal ventrolateral spine. Hooks on ischia of second and third pereopods simple, that on latter occasionally very weakly bituberculate, both overreaching basioischial articulation and neither opposed by tubercle on corresponding basis; coxae of fourth and fifth pereopods with comparatively well developed caudomesial bosses, that on fifth subtuberculiform, and fourth with prominent cephalomesial boss. First pleopods of first form male symmetrical, arched caudally at distal end of proximal third, lacking both subapical setae and shoulder on cephalic

surface; terminal elements consisting of subdistally directed mesial process bearing longitudinal trough-like groove mesially, truncate distally, and not reaching so far distally as other 2 elements; central projection corneous, tapering apically, and curved caudodistally with tip directed at angle of about 35 degrees to distal two-thirds of shaft of appendage; and caudal process slender, extending caudodistally at about 40 degrees to shaft and reaching caudally beyond other 2 terminals. Annulus ventralis about 1.5 to 1.6 times as broad as long, caudal face with prominent proximomedian concavity receiving postannular sclerite when annulus moved posteriorly; subtransverse, undulating sinus situated either dextrally or sinistrally, extending from just lateral to distal part of proximomedian concavity laterally, ending on lateral surface of annulus. Postannular sclerite subconical, diameter at base 1.5 to 1.6 times height and almost two-thirds that of annulus.

*Holotypic male, form I.*—Cephalothorax (Fig. 1a, j) subovate, somewhat compressed. Greatest width of carapace slightly less than height at caudo-dorsal margin of cervical groove. Areola 1.9 times as long as wide with 6 or more punctations in narrowest section, its length constituting 26.7 percent of entire length of carapace (36.6 percent of postorbital carapace length). Surface of carapace punctate, many if not all punctations with short or long simple setae. Rostrum with slender lateral carinae gently converging anteriorly, terminating in short spines flanking base of broad, short acumen; latter almost reaching distal margin of penultimate segment of antennular peduncle; dorsal surface concave with usual submarginal setiferous punctations and scattered ones between rows. Subrostral ridge very weak but evident in dorsal view along caudal third of rostrum. Postorbital ridge rather low and short, terminating cephalically in small acute spine. Suborbital angle prominent, and, although with rounded apex, subacute. Branchiostegal spine rudimentary, reduced to angle on anteroventral flank of cervical groove. Cervical spine absent.

Abdomen and carapace subequal in width (6.5 and 6.6 mm). Pleura of third through fifth segments truncate ventrally and lacking angles. Cephalic section of telson with 2 spines in each caudolateral corner. Cephalic lobe of epistome (Fig. 1l) broadly joined to main body, rather short with undulating anterolateral borders and prominent anteromedian projection; main body with wide median depression occupying large part of area between epistomal zygoma and cephalic lobe. Epistomal zygoma broadly arched, its medial anterior-posterior length almost half that of main body of epistome, proximal podomere of antennular peduncle with strong ventromesial spine at about midlength. Antennal peduncle with well defined spine on distolateral surface of basis and very small one on ventral side of ischium; flagellum extending caudally to second abdominal tergum. Antennal scale (Fig. 1e) 2.3 times as long as broad, widest at midlength; mesial margin of lamellar area broadly rounded but with suggestion of angle anteromesially; distola-



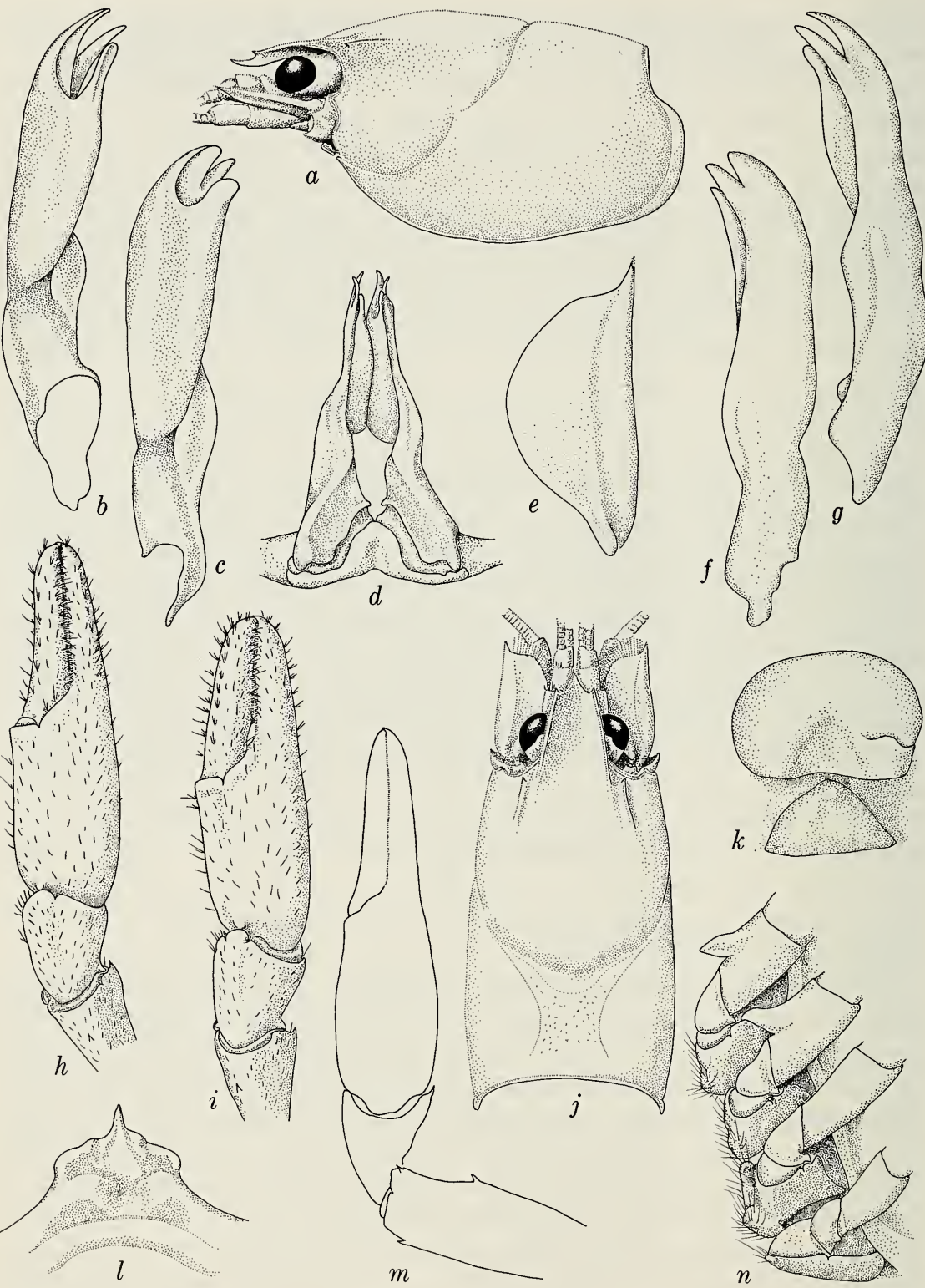


Fig. 1. *Cambarellus chihuahuae* (all illustrations are of holotype except **c** and **f** of morphotype, and **i** and **k** of allotype): **a**, Lateral view of carapace; **b**, **c**, Mesial view of first pleopod; **d**, Caudal view of first pleopods; **e**, Antennal scale; **f**, **g**, Lateral view of first pleopod; **h**, **i**,

teral spine broken on right scale but that on left reaching slightly beyond ultimate podomere of antennular peduncle.

Third maxilliped extending cephalically well beyond tip of rostrum, slightly overreaching antennal peduncle; mesial half of ischium with broad band of stiff simple setae, and single row of short plumose ones flanking ventromesial side of lateral costa; distolateral angle not produced; exopod reaching midlength of carpus.

Right chela (Fig. 1h, m) subovate in cross section, not strongly depressed; surface, except for opposable margins of fingers, lacking clearly defined tubercles and spines but bearing punctations studded with setae, most of which small but few long, conspicuous ones present, and mesial and lateral clusters arranged in rows on fingers; setae in cluster rows flanking opposable surfaces of fingers very conspicuous. Opposable margins of both fingers with broad band of minute denticles, that of dactyl also with single prominent tubercle at about one-fifth length of finger from base.

Carpus of cheliped almost 1.5 times as long as broad, bearing setiferous punctations, and with shallow depression dorsally; distal ventrolateral articular condyle with strong spine. Merus, likewise with setiferous punctations, bearing 3 conspicuous spines: one dorsodistally, another ventrally on level short distance proximal to dorsal spine, and third on distal ventrolateral angle. Ischium with setiferous punctations, without spines or tubercles, and sufflamen in form of right angle, not produced.

Hooks on ischia of second and third pereiopods (Fig. 1n) simple and overreaching corresponding basioischial articulation, neither opposed by tubercle on bases; that on third tapering and somewhat clawlike. Coxa of fourth pereiopod with prominent setiferous caudomesial and cephalomesial bosses, latter directed cephalically; coxa of fifth pereiopod with tuberculi-form caudomesial boss also studded with long stiff setae.

Sternum between second, third, and fourth pereiopods rather deep; lateral margins not strongly produced ventrally and setae borne on them not conspicuous.

First pleopods (Fig. 1b, d, g) as described in "Diagnosis." Both lobes of proximal podomere of right uropod with prominent spine; distomedian spine on mesial ramus premarginal.

*Allotypic female*.—Differing, other than in secondary sexual features, from holotypic male in following respects: rostral margins slightly convex

---

←

Dorsal view of distal podomeres of cheliped; j, Dorsal view of carapace; k, Annulus ventralis; l, Epistome; m, Lateral view of distal podomeres of cheliped; n, Proximal podomeres of second through fifth pereiopods.



laterally, subrostral ridges evident dorsally almost to base of marginal spines on lateral rostral carinae; acumen reaching slightly beyond midlength of ultimate podomere of antennular peduncle; suborbital angle slightly obtuse; cheliped (Fig. 1i) with merus bearing moderately well defined ventromesial row of 9 tubercles; mesial margin of ischium with row of 3 minute tubercles. See "Measurements" in Table 1.

Annulus ventralis and postannular sclerite (Fig. 1k) as described in "Diagnosis."

*Morphotypic male, form II.*—Differing from holotypic male in following respects: main body of epistome with prominent anteromedian fovea; exopod of left third maxilliped regenerated, not reaching carpus; spines on carpus and merus of cheliped much reduced; hooks on ischia of second and third pereipods distinctly reduced in size and not reaching corresponding basioischial articulation. First pleopod (Fig. 1c, f) more nearly straight than in holotype; terminal elements disposed as in latter but all shorter, heavier, and central projection non-corneous; caudal process lacking longitudinal sulcus mesially.

Color notes: (These are based on a  $2 \times 2$  transparency kindly donated to me by Mr. Smith.) Ground color bluish gray overlain by complex markings of brown to charcoal. Rostral margins and postorbital ridges very dark and dorsal surface of rostrum only slightly paler. Hepatic region with large irregular splotch extending dorsally onto gastric region. Charcoal arcs superimposed on branchiocardiac grooves, and dark transverse bar joining them in anterior part of areola and much paler one across posterior part. Branchiostegites with prominent brown to charcoal longitudinal stripes dorso-laterally, mesial margin of stripes regular but ventral margin produced in two or three cephaloventrally directed prominences, latter becoming progressively paler ventrally. Posterior part of dorsolateral stripes on carapace continuous with paired, broad, dorsolateral stripes on abdomen, latter stripes flanking median longitudinal pale one, it broad and almost white on first abdominal segment, tapering and becoming darker posteriorly to sixth segment where ending. Dorsolateral stripes with pale subelliptical spots on each of segments 2 through 5. All of first and dorsal part of second through sixth pleura white; latter area on posterior 5 segments flanked ventrally by longitudinal almost black marking separating dorsal white area from smaller white spot on pale tan ventral region. Telson mostly dark, especially lateral parts of anterior section, lateral cleft areas, and posteromedian section. Uropods with basal podomere very dark, lateral half of each ramus very pale to white for most part, and mesial halves brownish; distal borders with irregular dark splotches. Pereiopods gray with dark markings; dactyl of cheliped strikingly dark. Flagella of antennules and antennae orange tan.

*Size.*—The largest specimen available is a first form male having a carapace length of 17.0 (postorbital carapace length 13.0) mm. Corresponding

Table 1.—Measurements (mm) of *Cambarellus chihuahuae*.

	Holotype	Allotype	Morphotype
Carapace:			
Entire length	12.3	12.4	11.6
Postorbital length	9.3	9.1	8.6
Width	6.6	6.8	6.1
Height	6.7	7.1	6.3
Areola:			
Width	1.8	2.0	1.5
Length	3.4	3.5	3.2
Rostrum:			
Width	2.3	2.1	2.0
Length	3.0	3.2	2.9
Chela:			
Length, palm mesial margin	3.9	2.9	3.8
Palm width	2.5	2.0	2.2
Length, lateral margin	8.3	6.6	7.8
Dactyl length	4.0	3.0	3.5
Abdomen:			
Width	6.5	6.6	5.9
Length	14.8	14.5	14.7

lengths of the smallest first form male and of the single ovigerous female are 10.0 (7.5) and 11.9 (9.1) mm, respectively. The latter was carrying 59 eggs 1.2 to 1.3 mm in diameter.

*Type-locality*.—Ojo de Carbonera, 4.3 km south of Ejido Rancho Nuevo approximately 36 airline km west of Villa Ahumada (106°51', 30°35'N), Chihuahua, Mexico. The specimens were collected by R. R. Miller<sup>1</sup>, M. L. Smith, E. Marsh, and B. Chernoff (see "Range and Specimens Examined"), and the following data were supplied by the former two. Ojo de Carbonera is one of five springs in the southern part of the endorheic basin in which the Ejido Rancho Nuevo is situated. Water arises from a cluster of boils emerging through solution holes in carbonate rock and flows about 100 m before being dispersed in an irrigation complex. The stream is some 1 to 2.5 m wide and, except in solution pockets, no more than 10 cm deep. The clear water (27°C on 28 May 1978 and 6 June 1979) flows with a moderate current over a sand or gravel bed and supports a sparse vegetation consisting of filamentous algae, *Chara* sp., *Nasturtium* sp., and submerged grass. Most of the crayfish were collected in the grass and among the vegetation hanging

<sup>1</sup> Work in Mexico by Dr. Miller was supported by a grant: NSF DEB 77-17315.

in the water. A few were seen crawling over sand or fine gravel where the current was not strong, and others were observed on the walls of solution holes, in crevices, and beneath overhanging ledges.<sup>2</sup>

*Disposition of types.*—The holotypic male, form I, allotypic female, and morphotypic male, form II, are deposited in the National Museum of Natural History, Smithsonian Institution, nos. 148895, 148896, and 148897, respectively. Of the paratypes, 1♂ I, 1♀, and 1♂ II, are deposited in the British Museum (Natural History), a like series in the Rijksmuseum van Natuurlijke Historie, and the remaining ones consisting of 37♂ I, 43♀, 42♂ II, 12 juv. ♂, 16 juv. ♂, and 1 ovig. ♀ in the National Museum of Natural History.

*Range and specimens examined.*—Known only from the type-locality and three nearby springs: (1) type-locality, 31♂ I, 37♀, 38♂ II, 10j♂, 9j♀, 1 ovig ♀, 28 May 1978, RRM, MLS, EM, coll.; 3♂ I, 3♀, 4♂ II, 2j♂, 4j♀, 1 Jun 1979, MLS, BC. (2) Ojo del Apache, about 3 km SW of Ojo de Carbonera, 2♂ I, 1♀, 1♂ II, 31 May 1979, MLS, BC. (3) Ojo El Medio, about 0.5 km N of Ojo de Carbonera, 4♂ I, 5♀, 2♂ II, 2j♀, 2 June 1979, MLS, BC. (4) Ojo Solo about 3 km N of Ojo de Carbonera, 1j♀, 2 Jun 1979, MLS, BC.

*Variations.*—Attention has been called in the "Diagnosis" to most of the variations noted. Among those not included there are slight variations in the position of the lateral rostral carinae and the relative position of the apex of the acumen. The lateral carina is visible in dorsal aspect for only a short distance at the base or from there to any level along the length of the rostrum to the marginal spine; the apex of the acumen reaches from the midlength of the penultimate podomere of the antennular peduncle to the distal extremity of the ultimate podomere. While there is considerable variation in the contour of the anterolateral margins of the cephalic lobe of the epistome, the latter is consistently short, excluding the cephalomedian projection, little longer than the anterior-posterior median length of the epistomal zygoma; the median depression of the main body of the epistome leads to a distinct fovea in some specimens and in others consists of no more than a broad, shallow excavation. The hook on the ischiopodite of the third pereopod in a number of specimens bears a small angular prominence on the side opposing the podomere that is reminiscent of the proximal tubercle in those species in which the hook is distinctly bituberculate. Although there is variation in the sizes of the spines on the several podomeres of the cheliped, the arrangement described in the holotype appears to be consistent. The ventromesial row of tubercles on the merus of the cheliped of the allotype is rarely evident; however, vestiges, represented by an irregular ventrome-

---

<sup>2</sup> Additional information on the type-locality is presented by M. L. Smith and R. R. Miller in their "Systematics and variation of a new cyprinodontid fish, . . . , from Chihuahua, Mexico" published in volume 93, number 2 of this journal.



sial margin, of the row may be discerned in almost all of the specimens. In at least two of the first form males, the mesial process of the first pleopod is almost spiculiform. In the largest male, the dextral pleopod is aberrant and obviously has been regenerated; and the slender mesial process on the sinistral pleopod appears to have been regenerated. In another male, however, the process on both appendages is tapering, and there is no evidence of injury or regeneration.

*Relationships.*—There is every reason to believe that this crayfish has closer affinities with the Mexican segment of the genus than with those species occurring in the United States. Evidence of this kinship is best observed in the structure of the first pleopod of the first form male. In respect to the broad areola it is more similar to *Cambarellus areolatus* (Faxon, 1885:123) and *C. alvarezi* Villalobos (1952:525), species the ranges of which are closest to that of *C. chihuahuae*, than to any others. It differs from both of these crayfishes in possessing a distinctly shorter, more distally directed mesial process on the first pleopod of the male, and in exhibiting spines on the merus and carpus of the cheliped. The broad areola, less than three times as long as wide, will serve to separate it from other species reported from Mexico (see Hobbs, 1974).

*Cambarellus blacki*, new species  
Fig. 2

*Diagnosis.*—Pigmented, eyes well developed. Rostrum with marginal spines or tubercles, median carina absent. Carapace with or without small cervical spine. Areola 2.5 to 3.0 (average 2.8) times as long as broad and constituting 28.2 to 31.2 (average 30.1) percent of total length of carapace (37.3 to 41.7, average 40.1, percent of postorbital carapace length). Suborbital angle acute to subacute. Branchiostegal spine very small to obsolete. Cephalic extremity of postorbital ridge acute or rounded. Antennal scale approximately 2.5 times as long as wide, broadest at about midlength. Merus and carpus of cheliped with or without spines. Hooks on ischia of second and third pereopods bituberculate, neither reaching basioischial articulation nor opposed by tubercle on corresponding bases; coxae of fourth and fifth pereopods with prominent cephalo- and caudomesial bosses, former somewhat laterally disposed; coxa of fifth pereopod devoid of caudomesial boss. First pleopods of first form male symmetrical, with distinct hump on cephalic surface at about midlength, same surface lacking both subapical setae and shoulder; terminal elements consisting of heavy subtriangular mesial process disposed caudally but with free apical part bent somewhat distally; central projection corneous, tapering from base, strongly curved caudally with tip directed at about 90 degrees to shaft of appendage, not reaching so far caudally as caudal process; latter similar in shape to and situated cau-



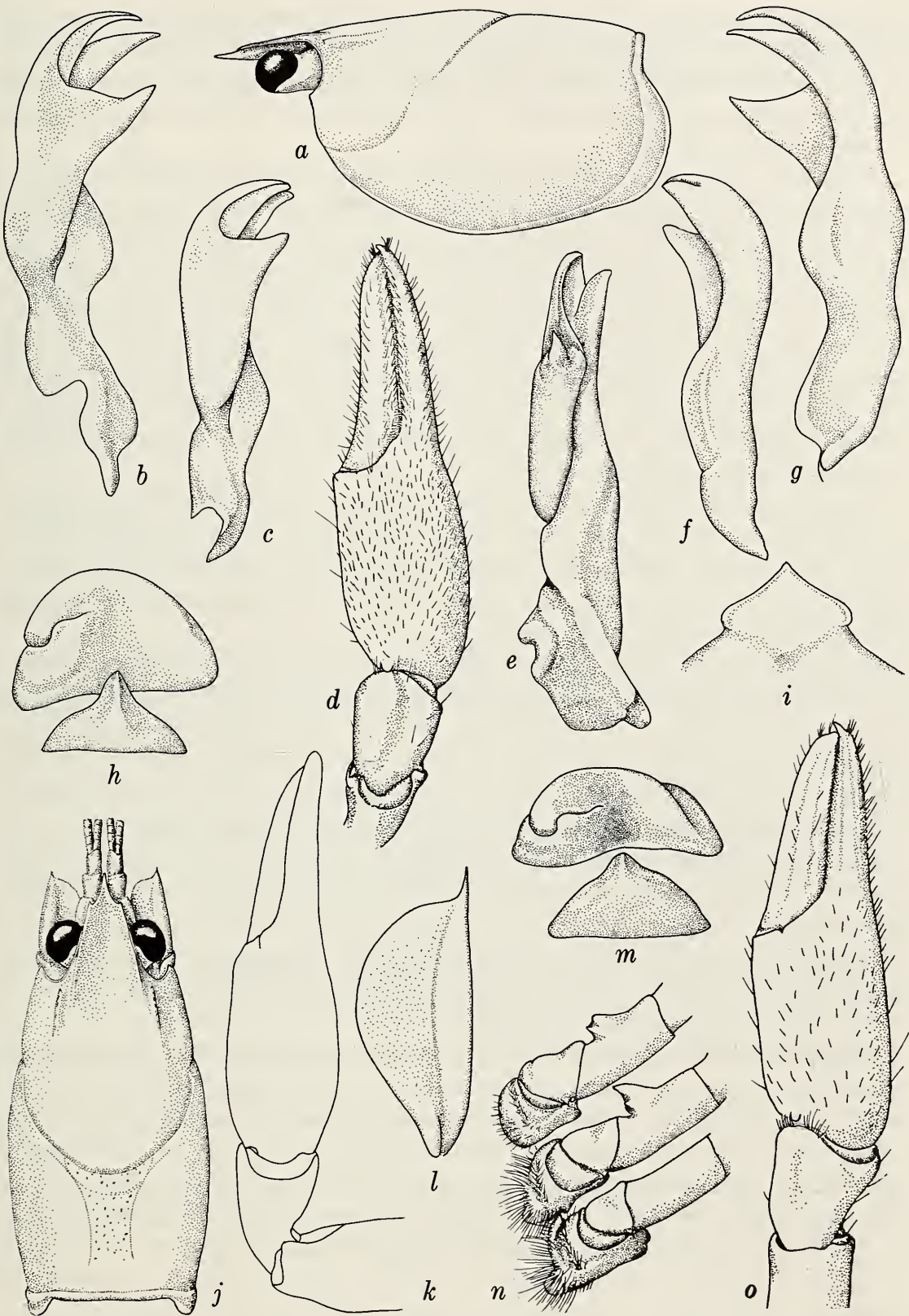
dolaterally and subparallel to central projection; caudal and mesial processes reaching about same level caudally. Annulus ventralis semicircular in outline with basal caudomedian surface excavate; sinuous sinus extending either dextrally or sinistrally from more ventral part of excavation to lateral surface of annulus and flanked toward base of annulus by inflated region intensifying asymmetry of structure. Postannular sclerite subtriangular in outline, about 1.8 times as broad as high, with free apex directed cephaloventrally, and caudoventral surface bearing median ridge terminating on latter apex; sclerite partly enveloped in excavation on caudal surface of annulus when brought into contiguous position.

*Holotypic male, form I.*—Cephalothorax (Fig. 2a, j) subovate, slightly compressed. Greatest width of carapace subequal to height at caudalodorsal margin of cervical groove. Areola 3.0 times as long as wide with 5 punctations in narrowest section, its length constituting 30.0 percent of entire length of carapace (39.1 percent of postorbital carapace length). Surface of carapace punctate, many punctations bearing short or long simple setae. Rostrum with slender lateral carinae converging anteriorly, terminating in short spines marking base of rather slender acumen; latter reaching base of ultimate podomere of antennular peduncle; dorsal surface subplane and densely studded with setiferous punctations; many setae subtending mesial margin of lateral carinae, and submarginal ones on acumen decidedly longer than those borne on remainder of dorsal surface; setae progressively dense from base of rostrum to apex of acumen. Subrostral ridges weak but evident in dorsal aspect along slightly more than basal half of rostrum. Postorbital ridge low and short, terminating anteriorly in subacute tubercle. Suborbital angle obtuse. Branchiostegal spine obsolete. Cervical spine absent.

Pleura of third through fifth segments truncate ventrally and with posteroventral extremity subangular to angular. Cephalic section of telson with 2 spines in left and 1 in right (second detached) caudal corner. Cephalic lobe of epistome (Fig. 2i) broadly joined to main body, subtriangular, and with short anteromedian projection and large median depression at base invading main body; epistomal zygoma broadly arched and comparatively large. Proximal podomere of antennular peduncle with prominent spine on ventromesial angle just distal to midlength. Antennal peduncle with small spine

→

Fig. 2. *Cambarellus blacki* (all illustrations are of holotype except c and f of morphotype, and h, m, and o of allotype): a, Lateral view of carapace; b, c, Mesial view of first pleopod; d, o, Dorsal view of distal podomeres of cheliped; e, Caudal view of left first pleopod; f, g, Lateral view of first pleopod; h, Caudal view of annulus ventralis; i, Cephalic lobe of epistome; j, Dorsal view of carapace; k, Lateral view of distal podomeres of cheliped; l, Antennal scale; m, Caudoventral view of annulus ventralis; n, Proximal podomeres of second, third, and fourth pereopods.





on distolateral surface of basis; ischium without spine; flagellum extending caudally to second abdominal tergum. Antennal scale (Fig. 2l) 2.5 times as long as broad, widest at about midlength; mesial margin of lamellar area evenly rounded; distolateral spine reaching midlength of ultimate podomere of antennular peduncle.

Third maxilliped extending cephalically slightly beyond tip of rostrum; mesial half of ischium with broad band of stiff simple setae, and single row of short, mostly plumose ones flanking ventromesial side of lateral costa; distolateral angle not produced, exopod reaching distal half of propodus.

Right chela (Fig. 2d, k) subovate in cross section, weakly depressed; surface, except for opposable margins of fingers, lacking tubercles and spines but bearing setiferous punctations and rows of mesial and lateral setal clusters on fingers. Opposable margins of both fingers with broad band of minute denticles, that of dactyl with conspicuous tubercle at approximately one-fifth length of finger from base.

Carpus of cheliped about 1.8 times as long as broad, studded with setiferous punctations and with broad longitudinal depression dorsally; neither it nor merus and ischium with spines or tubercles; sufflamen on ischium well developed, consisting of prominent lobe projecting proximally from postaxial proximal angle of podomere.

Hooks on ischia of second and third pereiopods (Fig. 2n) bituberculate, not overreaching corresponding basioschial articulation and neither opposed by tubercle on bases; proximal tubercle of hook on third pereiopod less conspicuous than that on second. Coxa of fourth pereiopod with prominent setiferous caudomesial and cephalomesial bosses, latter directed cephalolaterally; coxa of fifth pereiopod lacking setiferous caudomesial boss.

Sternum between second, third, and fourth pereiopods deep; lateral margins not strongly produced ventrally but bearing conspicuous row of plumose setae.

First pleopods (Fig. 2b, e, g) as described in "Diagnosis." Both lobes of proximal podomere of uropod with prominent spine; distomedian spine on mesial ramus reaching distal margin of ramus.

*Allotypic female*.—Differing from holotypic male, other than in secondary sexual characters, in following respects: postorbital ridge ending cephalically in short spines; cervical spine present; caudoventral angles of third through fifth pleura of abdomen more rounded; chela (Fig. 2o) with opposable margin of fixed finger bearing tubercle one-third length of finger from base and single row, rather than band, of minute denticles; regenerated left cheliped with poorly developed sufflamen. See "Measurements" in Table 2.

Annulus ventralis and postannular sclerite (Fig. 2h, m) as described in "Diagnosis."

*Morphotypic male, form II*.—Differing from holotype in following respects: postorbital spine moderately well developed; suborbital angle sub-

Table 2.—Measurements (mm) of *Cambarellus blacki*.

	Holotype	Allotype	Morphotype
Carapace:			
Entire length	9.0	10.3	7.3
Postorbital length	6.9	7.5	5.2
Width	4.4	5.3	3.7
Height	4.3	5.3	3.4
Areola:			
Width	0.9	1.1	0.8
Length	2.7	2.9	2.0
Rostrum:			
Width	1.5	2.0	1.3
Length	2.4	2.9	2.1
Chela:			
Length, palm mesial margin	3.1	2.7	1.9
Palm width	2.0	1.9	1.4
Length, lateral margin	6.5	6.7	4.4
Dactyl length	3.0	3.5	2.2
Abdomen:			
Width	3.9	5.2	3.3
Length (approximate)	*	14.0	9.0

\* Broken.

acute; tubercles and minute denticles on opposable margins of fingers of chela as in allotype; carpus of cheliped bearing ventrodistal spine, and merus exhibiting dorsal, ventral, and ventral distolateral spines; hooks on ischia of second and third pereopods greatly reduced, both low, simple, and tuberculiform and flanked proximally by broad emargination; bosses on coxa of fourth pereopod much reduced in size, cephalomesial one hardly recognizable as more than end of mesial longitudinal ridge on podomere. First pleopod (Fig. 2c, f) markedly similar to that of holotype but caudal process and central projection comparatively shorter, more robust, and contiguous almost to tip of latter; mesial process with shorter, more rounded distal section.

*Size*.—The largest specimen observed is the allotype, which has a carapace length of 10.3 (postorbital carapace length 7.5) mm. Corresponding lengths of the smallest and largest first form males are 9.0 (6.9) and 9.6 (7.2) mm.

*Type-locality*.—Small cypress pond at Oak Grove, Escambia County, Florida. The specimens were collected with a scrim dipnet pushed through grasses along the edge of the pond.



*Disposition of types.*—The holotypic male, form I, the allotypic female, and morphotypic male, form II, are deposited in the National Museum of Natural History, nos. 148901, 148902, and 148903, respectively, as are the paratypes consisting of 2♂ I, 3♀, 11 juv. ♂, and 14 juv. ♀.

*Range.*—Known only from the type-locality.

*Variations.*—The most obvious variation is in the presence or absence of spines in various body regions; small cervical spines are present in only three of the adults but are evident in more of the juveniles; only three of the adults bear spines on the carpus and merus of the chelipeds, but most of the juvenile specimens exhibit such spines. Even though spines are consistently present on the marginal carinae of the rostrum and at the cephalic extremity of the postorbital ridges, they are decidedly longer in the juveniles than in adults; however, they are not uniformly small in the latter. In some juveniles and adults, the subrostral ridge may be seen in dorsal view from the caudal margin of the orbit to the marginal spine of the rostrum, but in most specimens they are not visible much beyond the level of the eye. Because of the dense setae on the distal part of the carpus and ventromesial surface of the merus of the cheliped, in some specimens the margin of the podomere is obscured and small spines or tubercles thereon might be overlooked; in at least one specimen, however, a small spine is present on the dorsal distomesial corner of the carpus and a small one on the ventral surface of the merus. Other variations are noted in the "Diagnosis" as well as in the descriptions of the allotype and morphotype. See "Measurements" in Table 2.

*Relationships.*—*Cambarellus blacki* has its closest affinities with *C. schmitti* Hobbs (1942:149) and *C. lesliei* Fitzpatrick and Laning (1976:138), and the single locality in which it has been found lies between the areas frequented by them. It differs from both in possessing a shorter rostrum with weaker marginal spines, decidedly smaller cervical spines that are often absent, and a more strongly arched first pleopod in the first form male. In *C. schmitti*, the terminal elements of the first pleopod of the first form male are disposed at angles no greater than 60 degrees to the shaft of the appendage; in *C. blacki*, the apices of the central projection and caudal process are directed at angles of about 90 degrees; furthermore, there is a much broader gap between the caudal and mesial processes in *C. blacki* than in the former. This crayfish differs further from *C. lesliei* in possessing bituberculate hooks on the ischia of the second and third pereopods, whereas in the latter only simple hooks have been observed on the second pereopod. In *C. lesliei*, the cephalomesial boss on the fourth pereopod of the male is directed laterally; in *C. blacki*, it extends more nearly cephalically; also, the apical part of the mesial process of the first pleopod of the latter is bent somewhat distally rather than extending almost caudally from its base as in *C. lesliei*.

*Etymology.*—I take pleasure in naming this crayfish in honor of my friend and fellow student of crayfishes Joe B. Black whose contributions to our knowledge of many species occurring in the southern part of the United States have been invaluable.

### Acknowledgments

I should like to thank Robert R. Miller and Michael L. Smith of the Museum of Zoology, University of Michigan, as well as those assisting them, for donating the specimens from Chihuahua to the Smithsonian, for field notes on the localities from which the crayfish were collected, and the latter for a color photograph of one of the specimens. I am also grateful to Lewis J. Marchand of Gainesville, Florida, for his assistance in obtaining the specimens from Florida. For their criticisms of the manuscript, I am indebted to Raymond B. Manning, Margaret A. Daniel, and C. W. Hart, Jr., of the Smithsonian Institution.

### Literature Cited

- Albaugh, Douglas, W., and Joe B. Black. 1973. A new crayfish of the genus *Cambarellus* from Texas, with new Texas distributional records for the genus (Decapoda, Astacidae).—*The Southwestern Naturalist* 18(2):177–185, figures 1, 2.
- Faxon, Walter. 1885. A revision of the Astacidae, Part I. The genera *Cambarus* and *Astacus*.—*Memoirs of the Museum of Comparative Zoology at Harvard College* 10(4):vi + 186 pages, 10 plates.
- Fitzpatrick, J. F., and Barbara A. Laning. 1976. A new dwarf crayfish (Decapoda: Cambaridae: Cambarellinae) from southwest Alabama and adjacent Mississippi.—*Proceedings of the Biological Society of Washington* 89(9):137–145, figure 1.
- Hobbs, Horton H., Jr. 1942. The crayfishes of Florida.—*University of Florida Publications, Biological Science Series* 3(2):v + 179 pages, 24 plates.
- . 1974. A checklist of the North and Middle American crayfishes (Decapoda: Astacidae and Cambaridae).—*Smithsonian Contributions to Zoology* 166:iii + 161 pages, figures 1–294.
- Villalobos, F., Alejandro. 1952. Estudios de los cambarinos mexicanos, X. Una nueva especie del género *Cambarellus* del estado de Nuevo León.—*Anales del Instituto de Biología, Universidad Nacional Autónoma de México* 22(2):525–532, 2 plates.

Department of Invertebrate Zoology, Smithsonian Institution, Washington, D.C. 20560.